

OSA-2381-62

28 November 1962

MEMORANDUM FOR THE RECORD

SUBJECT : Trip Report - [] to Sperry Rand,
Aerojet Delft, and Aeroflex Laboratories

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1. On 15 November I visited Sperry Rand Corporation, Great Neck, New York, with [] Washington representative and General Cabell, Sperry consultant, to examine laboratory laser capabilities for application to future reconnaissance systems. (Attachment #1)

2. Discussions with Robert Jagoe, Akeley Peterson, John Steves, R. D. Kroeger and others reveal that with presently available components a 500' diameter circle can be illuminated and recorded with a 1' ground resolution from 80,000' at 500 mph for a night reconnaissance system. However, the pulse repetition rate is six pulses per minute with a pulse energy of 100 joules. At 734' per second ground speed, a photograph could be taken of only 1/15 of the linear area covered. A system of this kind would weigh approximately 150 pounds. In order to provide continuous illumination for "strip" photograph of 500' width a system would weigh about 350 pounds, and require about eight cubic feet of installation space.

3. While the assumptions made for the purpose of this engineering analysis may not be applicable to the night reconnaissance problem, these are obvious trade-offs that should be considered, namely:

- a. Lower altitude versus higher ground speed.
 - b. Rearrange the energy pattern from a 500' diameter circle to a rectangle 20' by 9000' to coincide with a suitable slit width.
 - c. Lower flash lamp input versus higher repetition rate.
4. It appears that a night reconnaissance capability can be developed with a laser illumination source using presently available techniques and equipment. Sperry estimates one year for the first flight system.

25 YEAR RE-REVIEW

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5. I visited, on 16 November, Aerojet Delft, Engineers Hill, Plainview, Long Island, New York. I discussed high resolution catadioptric concentric lens with Dr. Vanderzandt and Ben Duhov. Lens is 48" focal length, 100 l/mm AWAR at high contrast. It is 40" long, 18" diameter and weighs 75 pounds.

Also discussed and examined their model M200A image intensifier tube. Characteristics of this tube are speed of f/0.9, 15° field of view 1000 times brightness gain and a shutter speed variable from 1 second to 1/100 second. Suitable for moonlight photography under static conditions. A two stage image intensifier tube is under development for ASD using film optics with a gain of 5000 that can use 1/250 second under starlight conditions on a 4 1/2" x 4 1/2" format.

6. Visited Aeroflex Laboratories, Long Island City, New York. Examined engineering model of an optical stabilizing unit and discussed with Mr. Revere Sanders possibility of applying principle to long focal length optics. System is called DORS for Disturbed Optical Ray Stabilizer. Werneke and Roalef at ASD are aware of this development as are [redacted] and [redacted]

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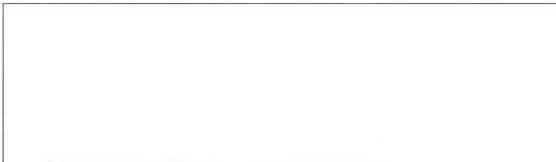
6. On the four missions that were completed on 23 October, the time from touchdown of the aircraft to driveaway of the film was a minute or two over or under one hour.

7. It was my impression that every one knew his job and did it efficiently. The only serious shortage involved lack of transportation. The around the clock hours that were being put in combined with the fact that SAC had commandeered all the base taxi service made it awkward to get from the line to the quarters.

8. Respooling work found necessary to convert 6000 foot rolls of film to 1500 foot missions were done with one of the "B" cameras, which involved possible scratching and static marks.

9. Preliminary examination of the results of the two speed shutter tests on SO-130 and 8402 film indicate that SO-130 produces a detectable improvement in resolution. This is horseback opinion of several PI's given before definitive examination and enlargement. They also liked the higher speed (old) shutter.

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